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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,004	06/28/2005	Ekkehard Pott	101215-184	9048

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EXAMINER

NGUYEN, TU MINH

ART UNIT	PAPER NUMBER
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3748

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/20/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/541,004

Applicant(s)

POTT ET AL.

Examiner

Tu M. Nguyen

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 June 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 20051017.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

1. An Applicant's Preliminary Amendment filed on June 28, 2005 has been entered. Claims 3-8, 10-14, and 17-21 have been amended. Overall, claims 1-21 are pending in this application.

Drawings

2. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because Figure 2 is of poor quality. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the non-compliant Arrangement of the Specification. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

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- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Claim Objections

4. Claims 1, 10-12, 15, and 18 are objected to because of the following informalities:

- Claim 1, line 4 of the claim, --at least one of-- should be inserted following "depending on". And on line 6 of the claim, "and/or" should read --, and--.

- Claim 10, line 4 of the claim, --at least one of-- should be inserted following "wherein". And on line 5 of the claim, "and/or" should read --and--.

- Claims 11-12, line 5 of each claim, --at least one of-- should be inserted following "optionally". And also on line 5 of the claim, "and/or" should read --and--.

- Claim 15, line 2 of the claim, "spitting" should read --splitting--. On line 6 of the claim, --at least one of-- should be inserted following "depending on". And on line 8 of the claim, "and/or" should read --, and--.

- Claim 18, line 2 of the claim, "one catalyst and/or" should read --one of one catalyst and--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-9, 13-18, 20, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Farmer et al. (U.S. Patent 6,244,043).

Re claims 1 and 15, as shown in Figures 1-3, Farmer et al. disclose a lean-runnable multi-cylinder engine (10) and a method for controlling the temperature of at least one catalyst (40) arranged in an exhaust gas cleaning system of said lean-runnable multi-cylinder engine, wherein energy is introduced into the exhaust gas cleaning system by a lambda split, and the introduction of energy is limited (see step 314 and lines 52-59 of column 4) depending on:

- at least one of a catalyst temperature (desired SOx purge trap temperature (Tdes)), exhaust gas temperature and exhaust gas mass flow rate, and

- at least one of the parameters rate of change (ΔT) of the catalyst temperature (see steps 212, 214, 216, and 312), rate of change of the exhaust gas temperature and rate of change of the exhaust gas mass flow rate.

Re claims 2 and 16, in the method and engine of Farmer et al., the exhaust gas cleaning system includes at least two exhaust gas paths (30, 34) disposed between the multi-cylinder engine (10) and the at least one catalyst (32 or 36), wherein a predefinable lambda value (see step 314) can be applied to each of the at least two exhaust gas paths.

Re claims 3 and 17, in the method and engine of Farmer et al., the exhaust gas cleaning system has at least one main catalyst (40) with at least two upstream pre-catalysts (32, 36), wherein each pre-catalyst (32 or 36) is arranged in a corresponding exhaust gas path (30 or 34) to which a predefinable lambda value can be applied.

Re claim 4, in the method of Farmer et al., the introduction of energy is limited with increasing, measured or modeled temperature of the at least one catalyst, in particular the main catalyst (40).

Re claim 5, in the method of Farmer et al., the introduction of energy in at least one catalyst, in particular in the main catalyst (40), is limited for a high positive time-dependent temperature gradient (if ΔT is large in step 212, the error in step 312 is small; and a feedback correction in step 314 is limited).

Re claim 6, in the method of Farmer et al., the introduction of energy in at least one catalyst, in particular in the main catalyst (40), is limited when a positive time-dependent temperature gradient progressively increases (see claim 5 above).

Re claim 7, in the method of Farmer et al., the introduction of energy is limited when the exhaust gas mass flow decreases (see Figure 4 and line 60 of column 4 to line 6 of column 5).

Re claim 8, in the method of Farmer et al., the amount of the introduced energy is defined by a split factor (R in step 814), which is determined when introduction of energy is requested, with the split factor defining (steps 816 and 810) the lambda values of the individual exhaust gas paths in the exhaust gas cleaning device.

Re claim 9, in the method of Farmer et al., when the lambda value before the at least one catalyst, in particular the main catalyst (40), is controlled to a desired value, the lambda value in the lean exhaust gas path is controlled to the lean lambda value, which results from the required split factor, depending on the lambda value measured before and after the at least one catalyst, in particular the main catalyst, whereas the rich exhaust gas path is pre-controlled (see Figures 7-8 and line 66 of column 6 to line 10 of column 7).

Re claims 13 and 18, in the method and engine of Farmer et al., the at least one catalyst is a NO_x-storage catalyst (40), whose temperature is controlled by introduction of energy into the exhaust gas cleaning system so that the NO_x-storage catalyst is desulfurized.

Re claim 14, in the method of Farmer et al., the introduction of energy is limited depending on the catalyst temperature (T_p), the time-dependent change of the catalyst temperature and the rate of change of the catalyst temperature (ΔT), and of the exhaust gas mass flow (see Figure 4).

Re claim 20, in the multi-cylinder engine of Farmer et al., the means comprise a control device (12), in which models and algorithms for a coordinated control of exhaust-gas-related and performance-related measures are stored in digitized form.

Re claim 21, in the multi-cylinder engine of Farmer et al., the multi-cylinder engine (10) is a gasoline engine, in particular a direct-injection gasoline engine, or a diesel engine.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Farmer et al. as applied to claim 15 above, in view of legal precedent.

The multi-cylinder engine of Farmer et al. discloses the invention as cited above, however, fails to disclose that a precious metal content of the at least two pre-catalysts is ≤ 3.59 g/dm³, in particular ≤ 2.87 g/dm³.

Farmer et al. disclose the claimed invention except for specifying an optimum range of precious metal content for the two pre-catalysts being ≤ 2.87 g/dm³. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a specific optimum range of precious metal content for the pre-catalysts, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

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9. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farmer et al. as applied to claim 8 above, in view of official notice.

The method of Farmer et al. discloses the invention as cited above, however, fails to disclose that with a very lean setting as high as $\lambda > 1.3$ on the lean exhaust gas path such that combustion instability becomes an issue, the lambda split control is temporarily interrupted.

It is well known to those with ordinary skill in the art that when a very lean value is set on the lean exhaust gas path such that combustion instability becomes an issue, the lambda split control is interrupted by either temporarily enriching of the entire mixture if the pre-control of the rich exhaust gas path is not modified accordingly, or the rich exhaust gas path is pre-controlled to lean lambda values. In this way, a loss of vehicle driveability due to misfiring in the engine can be prevented. Therefore, such disclosure by Farmer et al. is notoriously well known in the art so as to be proper for official notice.

Prior Art

10. The IDS (PTO-1449) filed on October 17, 2005 has been considered. An initialized copy is attached hereto.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of seven patents: Hattori et al. (U.S. Patent 4,012,906), Choi et al. (U.S. Patent 6,354,079), Hiranuma et al. (U.S. Patent 6,634,170), Watanabe et al. (U.S. Patent 6,763,659), Kuboshima et al. (U.S. Patent 7,152,392), Ohtake et al. (U.S. Patent 7,169,384), and Oishi et al. (Japan Publication 59-150921) further disclose a state of the art.

Communication

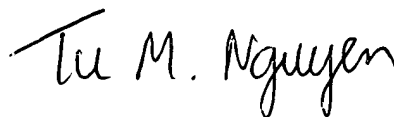
12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (571) 272-4862.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TMN

March 17, 2007



Tu M. Nguyen

Primary Examiner

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